Serial Number: 10/815,542 Filing Date: March 31, 2004

Title: STRESS-COMPENSATION LAYERS IN CONTACT ARRAYS, AND PROCESSES OF MAKING SAME

Assignee: Intel Corporation

IN THE CLAIMS

Please amend the claims as follows:

1. (Original) A process comprising:

pressing an electrical bump against a film, wherein the electrical bump is disposed on a substrate; and

forming a stress-compensation layer against the electrical bump, the substrate, and the film.

- 2. (Original) The process of claim 1, further including removing the film.
- 3. (Original) The process of claim 1, wherein removing the film at least partially exposes the electrical bump.
- 4. (Original) The process of claim 1, wherein pressing an electrical bump against a film includes embedding the electrical bump in the film in a range from about 5% embedded to about 95% embedded.
- 5. (Original) The process of claim 1, wherein forming a stress-compensation layer includes a process selected from capillary underfill, vacuum-assisted capillary underfill, positive-pressure assisted capillary underfill, and injection molding underfill.
- 6. (Original) The process of claim 1, wherein forming a stress-compensation layer includes a process of forming a particulate-containing stress-compensation layer.
- 7. (Original) The process of claim 1, further including curing the stress-compensation layer, selected from ultraviolet curing, microwave curing, thermal curing, chemical curing, timed curing, and combinations thereof.
- 8. (Original) The process of claim 1, further including:

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curing the stress-compensation layer; and coupling the electrical bump with an electrical contact.

9. (Original) The process of claim 1, further including:
curing the stress-compensation layer; and
coupling the electrical bump with an electrical contact, wherein curing the stresscompensation layer follows coupling the electrical bump.

10. (Original) A process comprising:

pressing an electrical bump in a ball grid array disposed on a substrate against a compressible film under conditions to at least partially embed the electrical bump into the compressible film;

forming a stress-compensation layer between the substrate and the compressible film; and removing the compressible film.

- 11. (Original) The process of claim 10, further including curing the stress-compensation layer.
- 12. (Original) The process of claim 10, further including curing the stress-compensation layer, selected from ultraviolet curing, microwave curing, thermal curing, chemical curing, timed curing, and combinations thereof.
- 13. (Original) The process of claim 10, wherein pressing an electrical bump includes embedding the electrical bump in the compressible film in a range from about 10% embedded to about 90% embedded.
- 14. (Original) The process of claim 10, wherein forming a stress-compensation layer includes a process selected from capillary underfill, vacuum-assisted capillary underfill, positive-pressure assisted capillary underfill, and injection molding compound underfill.

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15. (Original) The process of claim 10, wherein forming a stress-compensation layer includes a process selected from capillary underfill, vacuum-assisted capillary underfill, positive-pressure assisted capillary underfill, and injection molding compound underfill, the process further including:

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curing the stress-compensation layer, selected from ultraviolet curing, microwave curing, thermal curing, chemical curing, timed curing, and combinations thereof.

16. (Original) The process of claim 10, wherein forming a stress-compensation layer includes a process of forming a particulate-containing stress-compensation layer.

17-30. (Canceled)

- 31. (New) The process of claim 1, further including pushing the electrical bump into an uncured polymer spot that is disposed upon a board.
- 32. (New) The process of claim 10, further including pushing the electrical bump into an uncured polymer spot that is disposed upon a board.
- 33. (New) A process comprising:

pressing a flexible film with a press plate against an electrical bump, wherein the electrical bump is disposed on a substrate; and

flowing a stress-compensation layer precursor material between the flexible film and the substrate to form a stress-compensation layer against the electrical bump, the substrate, and the film.

34. (New) The process of claim 33, wherein pressing the flexible film with a press plate includes a press plate with a plate extension to form a mold chase between the flexible film and the substrate.

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35. (New) The process of claim 33, further including placing the substrate above and on a jig, followed by pressing the flexible film.

- 36. (New) The process of claim 33, wherein flowing a stress-compensation layer precursor material includes injection molding a material selected from a resin, an epoxy, a cyanate ester, a polyimide, a polybenzoxazole, a polybenzimidazole, a polybenzothiazole, and combinations thereof.
- 37. (New) The process of claim 33, further including:

first heating the stress-compensation layer precursor material to a temperature range from about 100° C to about 140° C; and

second holding the stress-compensation layer precursor material for a time from about 10 seconds to about 30 minutes.

38. (New) The process of claim 33, further including:

first heating the stress-compensation layer precursor material to a temperature range from about 100° C to about 140° C;

second holding the stress-compensation layer precursor material for a time from about 10 seconds to about 30 minutes;

removing the film; and followed by pushing the electrical bump into an uncured polymer spot that is disposed upon a board.

- 39. (New) The process of claim 33, further including pushing the electrical bump into an uncured polymer spot that is disposed upon a board.
- 40. (New) A process comprising:

pressing an electrical bump in a ball grid array disposed on a substrate, with a press plate against a compressible film under conditions to at least partially embed the electrical bump into the compressible film;

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injection molding a stress-compensation layer between the substrate and the compressible film;

reflowing the electrical bump; followed by

first heating the stress-compensation layer precursor material to a temperature range from about 100° C to about 140° C;

second holding the stress-compensation layer precursor material for a time from about 10 seconds to about 30 minutes; and

removing the compressible film.

- 41. (New) The process of claim 40, further including placing the substrate above and on a jig, followed by pressing the flexible film.
- 42. (New) The process of claim 40, wherein injection molding a stress-compensation layer includes a process of forming a particulate-containing stress-compensation layer.
- 43. (New) The process of claim 40, further including pushing the electrical bump into an uncured polymer spot that is disposed upon a board.
- 44. (New) The process of claim 40, wherein injection molding a stress-compensation layer includes a process of forming a particulate-containing stress-compensation layer, the process further including:

placing the substrate above and on a jig, followed by pressing the flexible film; and after removing the flexible film

pushing the electrical bump into an uncured polymer spot that is disposed upon a board.